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ABSTRACT

Gutman's means-end theory, widely used in market research, identifies three levels of abstraction: attributes, consequences, and values-associated with the use of products, representing the process by which physical attributes of products gain personal meaning for users. The primary methodological manifestation of means-end theory is the laddering interview, which is claimed to generate better insights than other qualitative/quantitative methods. This study asks: Can means-end theory, and its concomitant laddering methodology, be successfully applied in the context of human-computer interaction research, specifically to help understand the relationships between Web sites and their users? The study employed laddering interviews to elicit data concerning Web site attributes, their consequences, and user end-values. This data was duly processed and the results were subsequently appraised. Examination determined that means-end chains indeed characterize the process by which physical attributes of Web sites gain personal meaning for their users, thus proving the theory's applicability. Includes two figures. (Contains 12 references.) (Author)

Introducing a "Means-End" Approach to Human-Computer Interaction: Why Users Choose Particular Web Sites Over Others

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Abstract: Gutman's means-end theory, widely used in market research, identifies three levels of abstraction - attributes, consequences, and values - associated with the use of products, representing the process by which physical attributes of products gain personal meaning for users. The primary methodological manifestation of means-end theory is the laddering interview, which is claimed to generate better insights than other qualitative/ quantitative methods. This study asked: Can means-end theory, and its concomitant laddering methodology, be successfully applied in the context of human-computer interaction research, specifically to help understand the relationships between Web sites and their users? The study employed laddering interviews to elicit data concerning Web site attributes, their consequences, and user end-values. This data was duly processed and the results were subsequently appraised. Examination determined that means-end chains indeed characterize the process by which physical attributes of Web sites gain personal meaning for their users, thus proving the theory's applicability.

Introduction

Gutman's means-end theory (see Gutman 1982), which discusses the core underlying values that motivate consumers' purchase decisions, is immensely popular in the marketing research community (Peter & Olson 1994), and enjoys an impressive track record in the commercial sector where it is often used to generate message strategy themes for promotional campaigns (Gengler et al. 1999). The most common methodological manifestation of means-end theory in the field of marketing research is laddering, a method by which the core attributes and values that motivate product users are identified through a special form of in-depth, one-on-one interviews that force the respondent up a ladder of abstraction, thereby bridging relatively concrete product meanings at the product attribute level with more abstract meanings at the consequence and personal value levels (Gengler et al. 1999).

In support of laddering, Fortini-Campbell (1990) claims that other quantitative/ qualitative social scientific research methods - such as focus groups, surveys, and demographic information - often fall short of generating key insights about a product and of identifying a target audience in concise and well-defined terms, since common responses to the question of why a person chooses a particular product do not even begin to describe the deep underlying psychological and emotional reasons that influence people's choices.

Meanwhile, the celebrated consumer psychologist and University of Minnesota Professor Emeritus Dr. William D. Wells suggested to this researcher that means-end theory could very well prove to be *an excellent point of reference for unearthing the underlying core values that motivate Web site users as well*, and that he did not know of any prior studies that have used this theory in the substantive context of Web usage, or anywhere else within the broader field of human-computer interaction or HCI (W. D. Wells, personal communication, July 2000).

This study could therefore be a potentially valuable introduction of this new theoretical and methodological framework to the field of Web usage research in particular, and HCI in general. It is hoped that the insights uncovered by this study - along with those generated by subsequent studies of a similar nature - could be subsequently drawn upon to describe and delineate the characteristics of distinct Web user segments, through the use of techniques such as consumer prototyping, at an appropriate future occasion. Information of this nature would be of great potential significance to academic researchers, as well as to professionals in the Web industry.

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Research Question

This research study essentially poses the question: Can means-end theory, and its concomitant laddering methodology, be successfully applied in the context of human-computer interaction research, specifically to help understand the relationship between Web sites and their users? The study attempts to explore this question by employing a laddering methodology with the aim of eliciting data concerning the site-attributes, consequences, and end-values that motivate Web users to choose particular Web sites over others. With the resultant data at hand, detailed analysis can be done to conclude if means-end theory is indeed useful in the context of Web usage in particular, and HCI in general.

Review of Literature

Means-End Theory

Means-end theory examines the important meanings that users associate with the products they choose and consume, by distinguishing three levels of abstraction associated with the use of a product (Olson & Reynolds 1983): product attributes; consequences of product consumption; and personal values of the user. Product attributes are concrete meanings that represent the physical or observable characteristics of a product. Consequences of consumption are more abstract meanings that reflect the perceived benefits/costs associated with specific product attributes. Finally, personal values are highly abstract meanings that refer to centrally held, enduring beliefs, or end states of existence, that people seek to fulfill through their choice and consumption behavior (Rokeach 1973). Taken together, this pattern of associations from attributes to consequences and from consequences to personal values represents a special type of knowledge structure called a means-end chain (Gutman 1982, Howard 1977, Olson et al. 1983). The means-end chain model provides a simple way of characterizing the basic pattern of relationships by which the physical features or attributes of products gain personal relevance or meaning for users (Gengler et al. 1999).

Laddering

Laddering is the principal methodological manifestation of means-end theory. It is a technique by which the core attributes and values that drive product users are identified through a special form of in-depth, one-on-one interviews (Wansink 2000). This procedure is called laddering because it forces the respondent up a ladder of abstraction, and thus bridges relatively concrete product meanings at the attribute level with more abstract meanings at the consequence and personal value levels (Gengler et al. 1999). This is done by repeatedly asking "Why is that important to you?" questions. Data gathered by laddering interviews is analyzed to produce an accurate depiction of the concepts germane to the decision and the relationships between associated concepts, facilitating inferences and enabling the researcher to identify patterns that might not be evident in the raw data (Gengler et al. 1995, 1999).

Reynolds & Gutman, in their seminal (1988) article, describe the processing of laddering data as follows: The initial task of the data processing is to content-analyze all of the elements from the ladders, recording the entire set of ladders across respondents on a separate coding form, and developing a set of summary codes that reflect everything that was mentioned. Once the summary codes are finalized, numbers are assigned to each. These numbers are then used to score each element in each individual respondent's ladder. The next step involves the construction of an implication matrix, which displays the number of times each element leads to each other element. Once the implication matrix has been prepared, a hierarchical value map (HVM) can be constructed, which graphically represents all the respondents' ladders in the aggregate. Once a HVM is constructed, one typically considers any pathway from bottom to top as a potential chain representing a perceptual orientation that warrants consideration.

Reynolds & Gutman (1988) claim that such quantitative processing of qualitative interview data is one of the unique aspects of laddering. They cite several particularly valuable types of information afforded by HVMs obtained through laddering procedures, which can serve as a basis for segmenting users with respect to their value orientations for a product class or brand; assessing brands or products in a fashion similar to the use of more traditional ratings; evaluating competitive advertising; and developing advertising strategies.

Method

Interviewing

As part of the study, 50 in-depth laddering interviews were conducted. Through these interviews, an attempt was made to examine two different kinds of Web site use by respondents: use for primarily entertainment purposes; and use for primarily information gathering purposes. These distinctions were made on the basis of several preliminary interviews with random Web users, which suggested that they generally browsed the Web either to gather information relevant to their professional lives, or to access content that contributed to their personal lives by entertaining them. To operationalize the distinctions for the purpose of this study, a particular Web site was deemed an "entertainment" site if the respondent described his/her use of the site as primarily entertainment-oriented; and was deemed an "information" site, if the respondent described his/her use of the site as for primarily information gathering purposes. Of the 50 laddering interviews, 25 concentrated on entertainment Web sites and the other 25 on information Web sites.

The laddering interviews were conducted over the first four months of 2001. Respondents for the interviews were of diverse ages and ethnicities, came from varied walks of life, and were distributed across three U.S. states – Minnesota, Illinois and Connecticut. In each interview, the respondent was first asked to name his/her most favorite Web site, and to subsequently define whether s/he considered it to be an entertainment Web site or an information site. Once the particular genre of the Web site (within the broader entertainment/information category) was established (e.g. News, Astrology, Sport, Cooking, Music, Motorcycles, Chat, Search Engine, etc.), Reynolds & Gutman's (1988) "preference-consumption difference" technique was used to elicit attribute distinctions. The respondent was asked to name two other competing Web sites of the same genre as his/her favorite site, and was then asked why s/he favored this particular site over the other two. In the interests of consistency, only the highest-rated attribute was used as the basis for building an attribute-consequence-value ladder during the remaining part of the interview.

Data Processing

Strictly following the pioneering methodological procedure established by Reynolds & Gutman (1988), once all 50 laddering interviews were concluded, the first step in analyzing the data gathered using the interviews was to develop a set of summary codes that reflected every attribute/ consequence/ value mentioned by the respondents. Then followed the assignment of numbers to each code. Once the codes were established and numbered, their numbers were then used to score each element in each ladder producing a "raw" matrix (not shown here) with rows representing an individual respondent's ladder and columns corresponding to the sequential elements within the ladder. The number of columns corresponded to the number of elements in the longest ladder. With these coded raw matrices compiled, the final set of matrices, i.e. the implication matrices, were constructed in order to display the number of times each element leads to each other element, both directly and indirectly. In these matrices, the numbers are expressed in fractional form, with direct relations to the left of the decimal point and indirect relations to the right. Once the implication matrices were prepared, work started on the construction of the respective hierarchical value maps or HVMs. The HVMs were gradually built up by connecting all the chains formed by considering the linkages in the implication matrices, with a cut-off level of two direct relations established for the purpose of plotting the HVMs (Fig. 1-2). In these HVMs, any pathway from bottom to top can be considered as a chain representing a significant perceptual orientation.

Findings

Both sets of interviews raised six attribute codes each. It is noteworthy that 10 out of 12 attribute codes (barring "Better Site Design" and "Familiarity of Site") deal with content issues. From this data, it appears that content has been a very important factor in the choice of Web sites for the respondents in this study. Meanwhile, it is also interesting to note that both sets of ladders elicited exactly the same value codes – Satisfaction, Relaxation, Happiness, and Emotional Security. This indicates that both sets of respondents were essentially motivated by the same set of values in their choice of Web sites, whether for entertainment or for information.

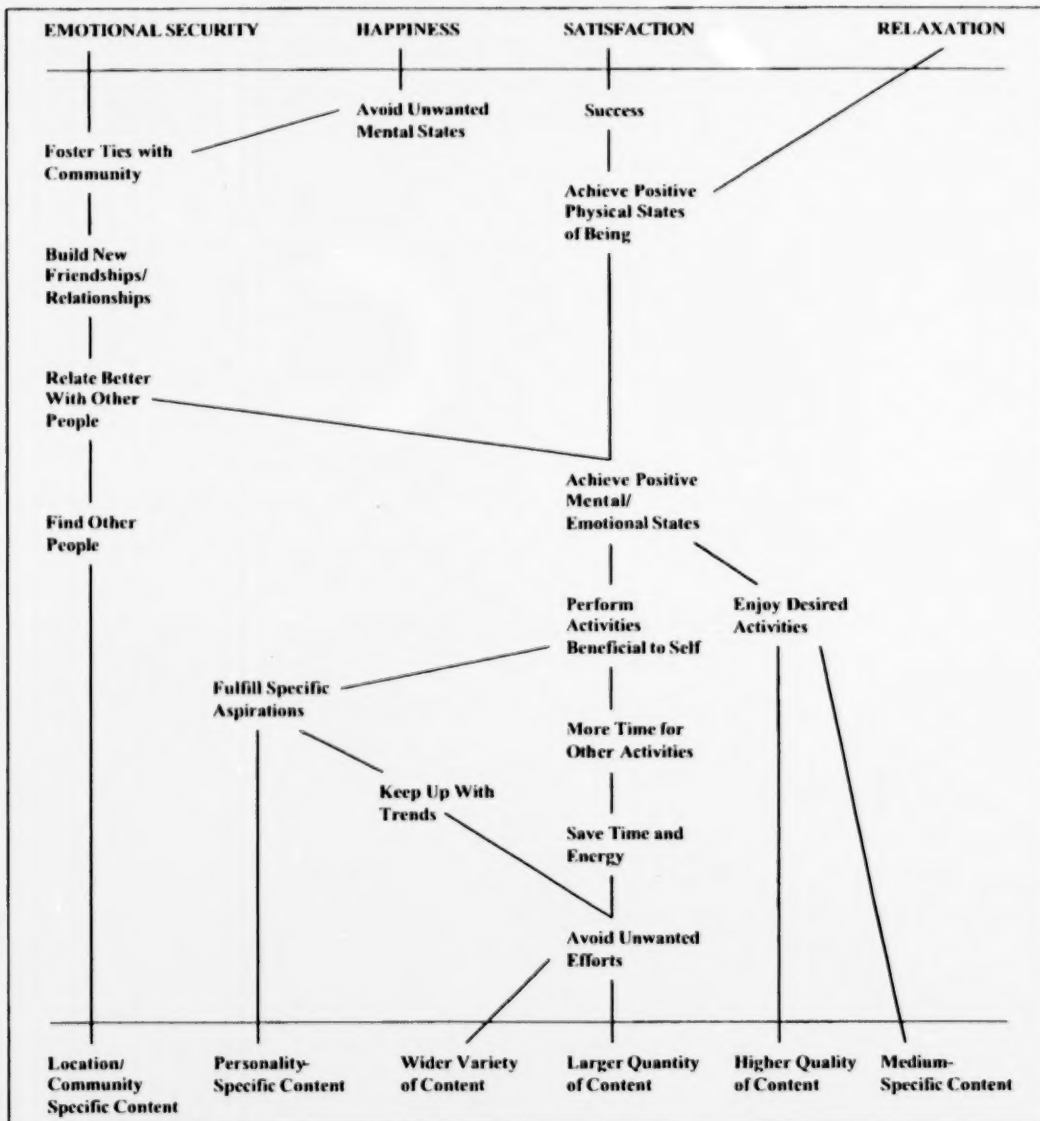


Figure 1: Hierarchical Value Map for Entertainment Web Sites

Furthermore, among the consequence codes, some are reasonably similar to each other (e.g. Save Time/Energy, Find/Interact with Other People, More Time for Other Activities, Success), while others are unique to entertainment Web Sites or to information Web sites. There could possibly be some valuable aspects of Web site usage indicated by the above differences also.

Meanwhile, looking at the HVMs can reveal certain interesting segmentations in the manner by which attributes are linked to particular consequences and values. For instance, in Fig. 2, a clear division can be made down the center of the map, between the linkages leading to Positive States of Being and on to Satisfaction/Emotional Security on the one hand, and the linkages leading to Get Information Quickly/ Save Time and on to Relaxation/ Happiness on the other. Similarly, in Fig. 1, the path leading from Location/Community-Specific Content to Emotional Security/ Happiness is fundamentally different from that leading from, say, Larger Quantity of Content to Satisfaction/ Relaxation.

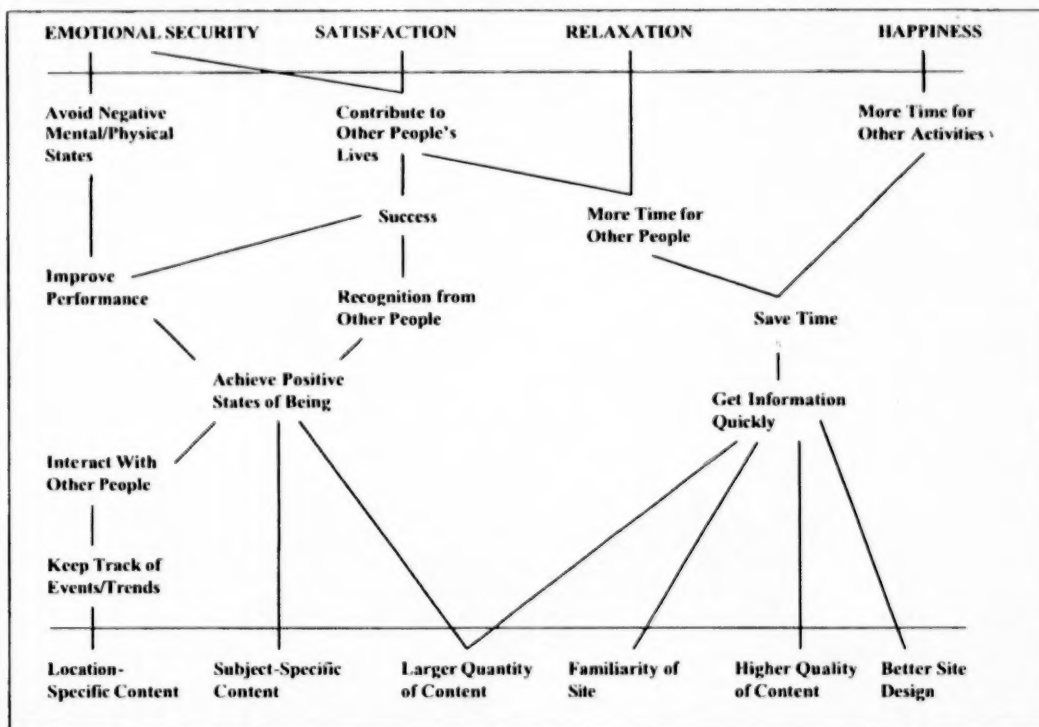


Figure 2: Hierarchical Value Map for Information Web Sites

Thus, a marketer attempting to segment users of his/her information Web site could reason thus: "There are basically two types of users of such sites. There are those that visit these sites in order to achieve certain positive states of being, which leads to improved performance/ recognition, which in turn helps them to succeed and to avoid negative states. This helps them contribute to other people's lives, thus achieving emotional security and satisfaction. These users seem to be attracted to location and subject-specific content. Meanwhile, there are those busy people that visit solely to get information quickly, which helps them save their precious time. This gives them more time to devote to other people/activities, which brings them relaxation and happiness. Such users look for site attributes such as familiarity, high-quality content, and good design."

Similarly, the marketer for an entertainment Web site could reason thus: "There are two types of users for sites like mine. There are those that use the sites to interface/network with other users, relate, build relationships, foster community ties, and thus achieve emotional security, happiness, and avoid unwanted mental states. These "people-minded" users are attracted primarily to location-specific content. Meanwhile, there are those who basically use these sites as a means of avoiding unnecessary efforts. With the time they save, they perform activities that helps them achieve positive goals. This helps them to relax, and to succeed, which in turn brings them satisfaction. It looks like these "success-minded" users desire access to a large, varied quantum of content through the site."

Implications

Therefore, can means-end theory, and its concomitant laddering methodology, be successfully applied in the context of HCI research, specifically to help understand the relationship between Web sites and their users? To begin with, the very fact that all of the 50 respondents who participated in the laddering interviews were able to name distinct site attributes, articulate the consequences of these attributes, and identify the end-values served by these consequences, suggests that means-end chains do undeniably characterize the basic pattern of relationships by which the physical attributes of Web sites gain personal relevance or meaning for

their users. It can thus be proposed that means-end theory can indeed be applied in the context of new media research, to help understand the relationships between Web sites and their users.

Meanwhile, it was also possible to successfully perform all the analysis techniques detailed by Reynolds & Gutman (1988) on the data gathered by the laddering interviews conducted as part of this study. This included formulation of meaningful content codes, compiling the raw matrices with coded rows representing individual respondents' ladders, preparing the implication matrices from the above coded data, and finally plotting the hierarchical value maps. If means-end chains could not be used to describe the relationships between Web sites and their users, it can be argued that it might not have been possible to perform all of the above operations and obtain consistently meaningful results. For instance, the fact that all 30 potential perceptual orientation chains in the HVM for entertainment Web sites (Fig. 1) and all 31 chains in the HVM for information Web sites (Fig. 2) make logical sense is an example of the results' meaningfulness.

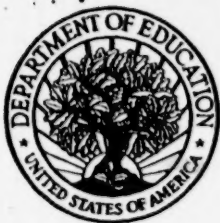
Besides, the fact that a majority of the respondents named content-related site-attributes as most relevant to them is in congruence with the opinion of many leading webmasters that good content is what motivates users to visit a Web site more than any other site attribute. To quote Silverio (1995 section 4 para. 2), "You can make your pages look absolutely fabulous but if they don't say anything, nobody's going to care." Meanwhile, according to Nelson (2000 para. 7), "Content is everything," and encourages repeat visits by users.

Final Remarks

The most important contribution of this study, in the researcher's opinion, is its successful demonstration of the applicability of Gutman's means-end theory – an important part of marketing research literature – in the context of human-computer interaction research (or more specifically, Web usage research). By describing the relationships of 50 Web users with their favorite Web sites in terms of attribute-consequence-value linkages, the study indicates that means-end chains definitely characterize the basic pattern of relationships by which the physical attributes of Web sites gain personal relevance or meaning for their users. The chief limitation of this study is that the current findings may not be generalizable to the whole universe of Web users, since the study only involves 50 respondents selected on a non-random basis. But then, the object of this study was simply to be an introductory demonstration of the use of a new theoretical and methodological framework within the substantive context of Web usage research, and not the formulation of meaningful hypotheses about the characteristics of Web users. The latter could be the goal of a future study, or meta-analysis, that enjoys access to a much more extensive set of interview data. This might actually permit the drawing of generalizable inferences, which would be of great significance to academic researchers of HCI as well as to professionals in the Web industry.

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